

APR 24 1997

ITEM 1

SUMMARY OF SAFETY AND EFFECTIVENESS**1. Indications for use:**

This software program should be used to quantitatively analyze the myocardial perfusion of patients' who have been injected with Cardiolite® (Technetium Tc99m Sestamibi) for a rest/stress same-day Single Photon Emission Computerized Tomography (SPECT) acquisition protocol. Cardiolite®, Kit for the Preparation of Technetium Tc99m Sestamibi is a myocardial perfusion agent that is useful in the evaluation of ischemic heart disease. Cardiolite®, Kit for the Preparation of Technetium Tc99m Sestamibi is useful in distinguishing normal from abnormal myocardium and in the localization of the abnormality, in patients with suspected myocardial infarction, ischemic heart disease or coronary artery disease. Evaluation of ischemic heart disease or coronary artery disease is accomplished using rest and stress techniques.

Cardiolite®, Kit for the Preparation of Technetium Tc99m Sestamibi is also useful in the evaluation of myocardial function using the first pass technique.

Rest-exercise imaging with Tc99m Sestamibi in conjunction with other diagnostic information may be used to evaluate ischemic heart disease and its localization.

In clinical trials, using a template consisting of the anterior wall, inferior-posterior wall and isolated apex, localization in the anterior or inferior-posterior wall in patients with suspected angina pectoris or coronary artery disease was shown. Disease localization isolated to the apex has not been established. Tc99m Sestamibi has not been studied or evaluated in other cardiac diseases.

It is usually not possible to differentiate recent from old myocardial infarction or to differentiate recent myocardial infarction from ischemia.

2. Device Description:

This medical device (CEqual®) is a diagnostic software program that quantitatively analyzes the myocardial perfusion of patients' injected

with Cardiolite® (^{99m}Tc Sestamibi) following a rest/stress same-day SPECT acquisition protocol. The algorithm automatically determines the processing parameters and, following operator verification of these parameters, samples the myocardium using maximum count profiles. These stress and rest profiles are then used to generate relative count "raw data" polar maps. In addition, the profiles are compared to a normal data base and the results of this comparison are used to generate quantitative stress and rest polar maps which indicate defect extent, severity, and reversibility for all abnormal perfusion areas of the patients' study. The final results are presented in the form of polar maps as well as a table indicating the % abnormal pixels in territories supplied by the left anterior descending, left circumflex, and right coronary arteries.

3. Marketing History:

There have been other diagnostic programs marketed in the past which perform similar functions to those performed by CEQUAL®. These programs were used to quantitatively analyze the myocardial perfusion of patients injected with Tl^{201} , another myocardial perfusion agent. The most widely utilized Tl^{201} quantitative programs are the Cedars-Sinai and General Electric's "Bullseye" methods. To our knowledge there have been no safety problems with either of these two methods which have been in the marketplace for over the past five years. In addition, the CEQUAL® program executing on the Siemens and General Electric computer systems have been in the marketplace since October 1992 with no safety problems reported.

4. Potential Adverse Effect On Health:

The intent of this program was to provide the physician with an adjunctive diagnostic tool to aid in the diagnostic interpretation of the patients' Cardiolite® same-day study. It was not meant to replace or eliminate the standard visual analysis of the Cardiolite® images. The physician should integrate all of the patients' clinical and diagnostic information, i.e. patients' history, stress and/or rest EKG, quality control images, visual interpretation of the tomographic images, and quantitative results, prior to making his final interpretation. This comprehensive processing technique (as with all diagnostic imaging) is not perfect, and will be associated with some false positive and false negative results. The accuracy of the program is listed in the operators manual and the physician should be aware of the accuracy when integrating the quantitative results for his final interpretation.

Therefore, this program has no direct adverse effect on health since the results represent only a part of the information which the physician will utilize for his final interpretation. The final responsibility for integration of the results and interpretation of the study lies with the physician.

5. Conclusions:

The safety of this program has been determined through the various stages of software development which included the code translation, debugging, testing, and in-house validation. The effectiveness of the program has been established in a prospective validation which included 35 patients acquired and processed at another institution. The accuracy results obtained with this program are similar to those obtained with previous quantitative analysis programs of the Tl-201 myocardial perfusion agent (1,2) and Cardiolite® (3,4). We contend that the method employed for the development and the final multicenter trial validation results of this quantitative software program (CEqual®) have proven its safety and effectiveness.

References

1. Depasquale EE, Nody AC, DePuey EG, et al: Quantitative rotational thallium-201 tomography for identifying and localizing coronary artery disease. *Circulation* 77:316-327, 1988.
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3. Van Train KF, Areeda J, Garcia EV, et al: Quantitative same-day rest-stress Technetium-99m sestamibi SPECT: definition and validation of stress normal limits and criteria for abnormality. *J Nucl Med* 1993; 34:1494-1502.
4. Van Train KF, Garcia EV, Maddahi J, et al: Multicenter Trial Validation for Quantitative Analysis of Same-Day Rest-Stress Technetium-99m-Sestamibi Myocardial Tomograms. *J Nucl Med* 1994; 35:609-618.